



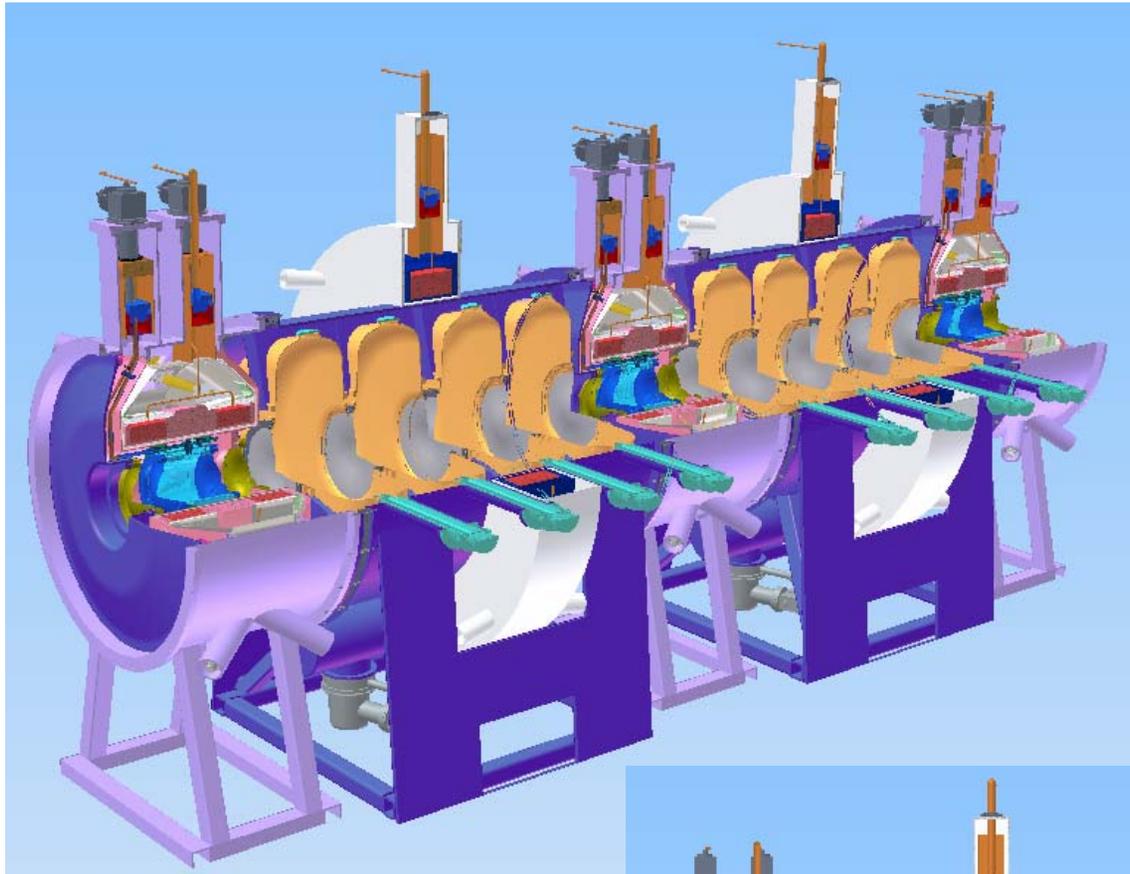
Overview of MICE Cooling Cell Engineering Design Progress

Muon Collaboration Phone Conference

November 19, 2004

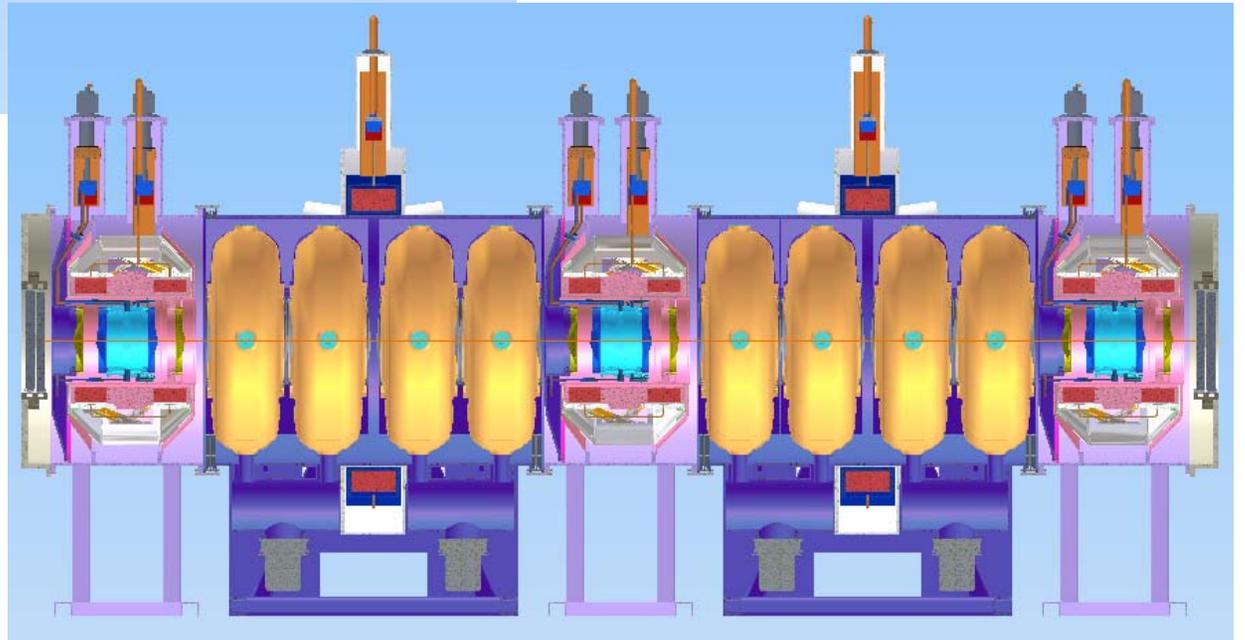
Steve Virostek

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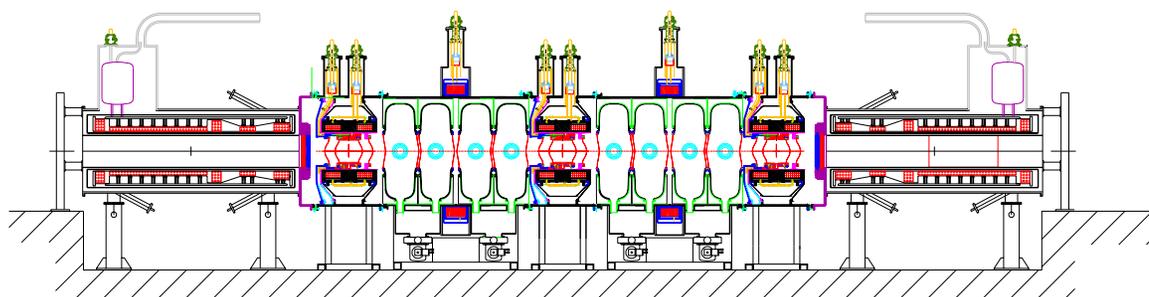


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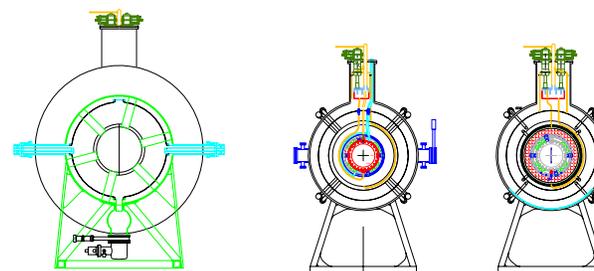
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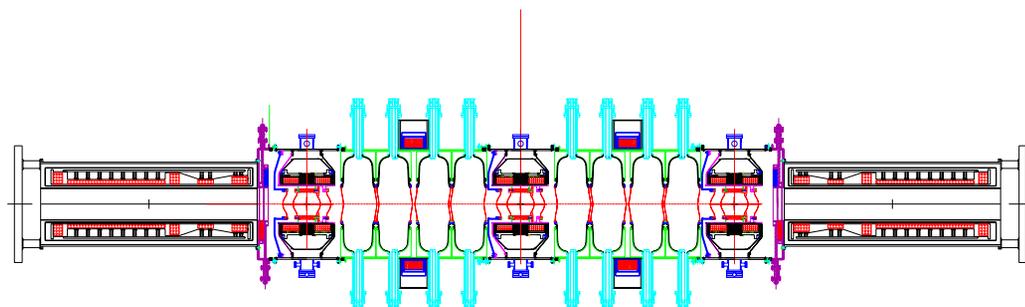
2D System Layout



Front elevation view



Side views

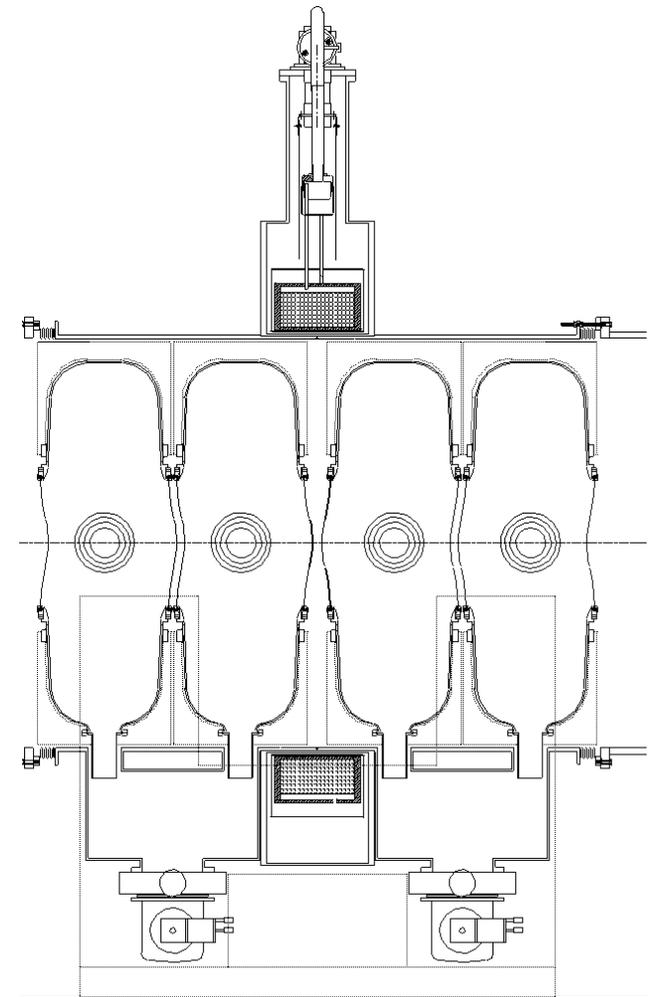
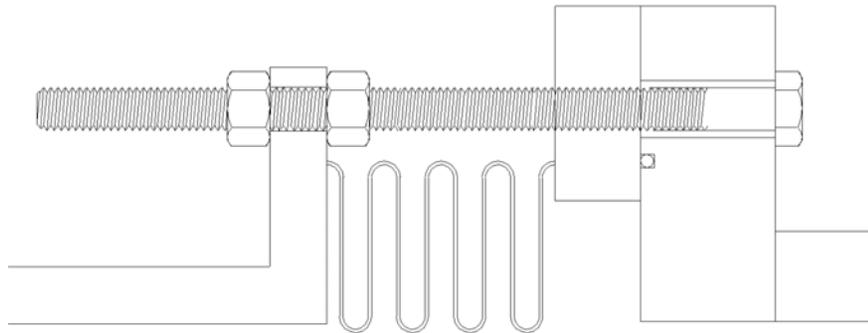


Plan View

Joint Configuration



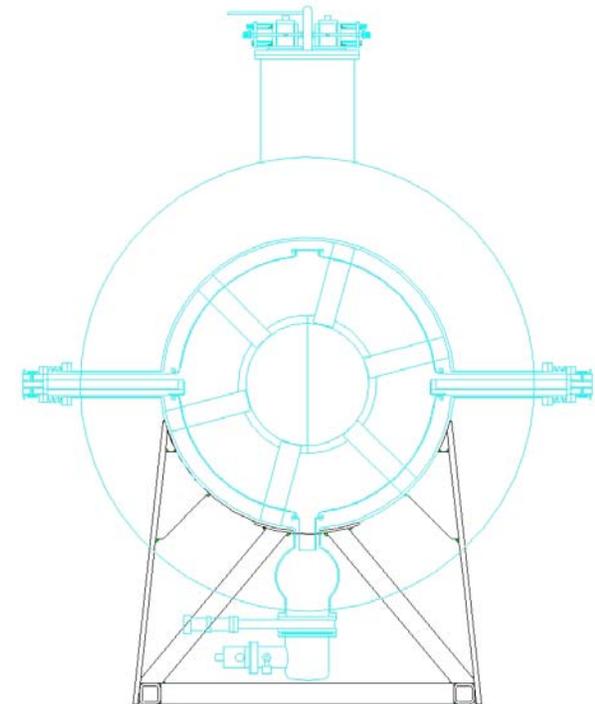
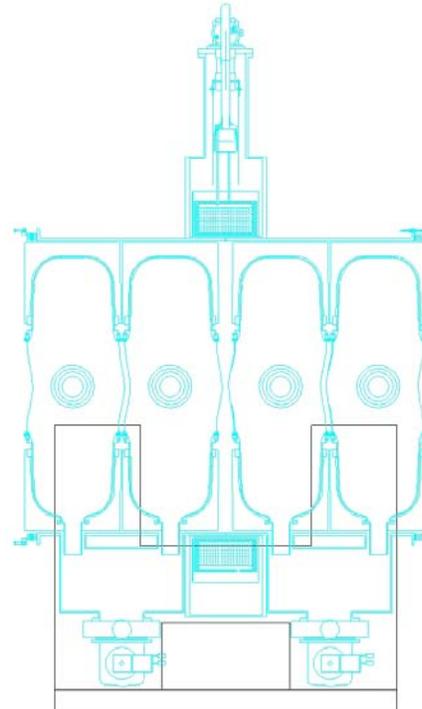
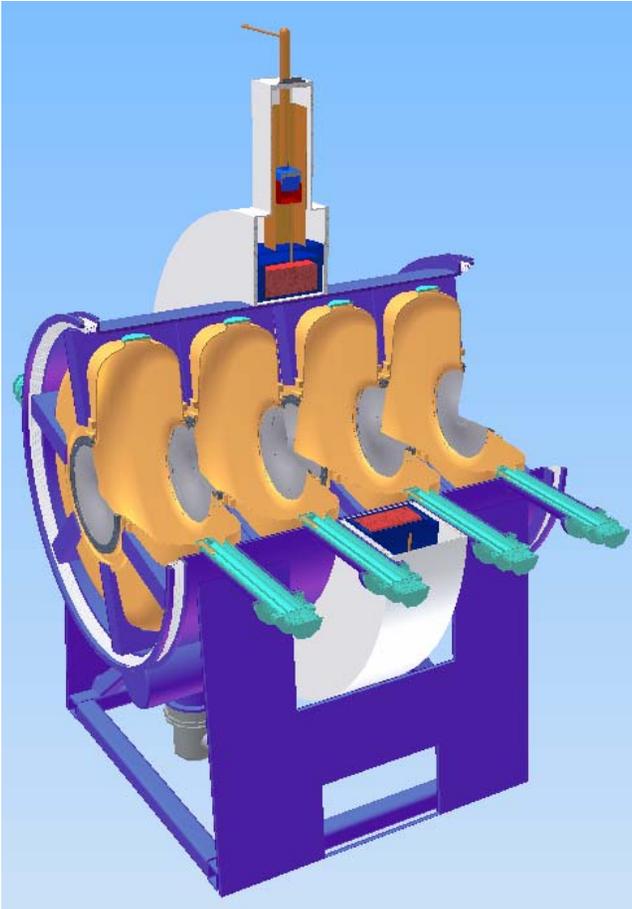
- Recent module-to-module joint design incorporates a commercially available (Hyspan) formed bellows
- Flexible bellows provides up to 20 mm for module installation/removal and relaxed tolerances
- Vacuum sealing achieved with metal wire or O-ring
- Bolts spanning bellows provide a strong and stiff bridge to transmit magnetic forces between modules
- RF/CC vessels to have a bellows assembly at both ends; AFC modules to have mating flanges w/o bellows; radiation shield assemblies to have a bellows
- Proposed design is compatible with all MICE steps (adaptor flange req'd for detector/detector setup)



Support Conceptual Design



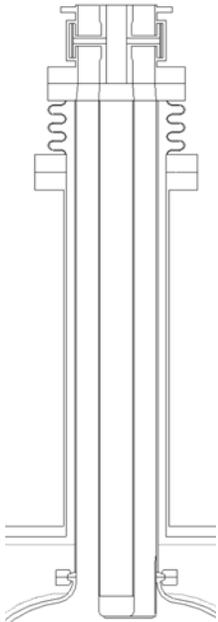
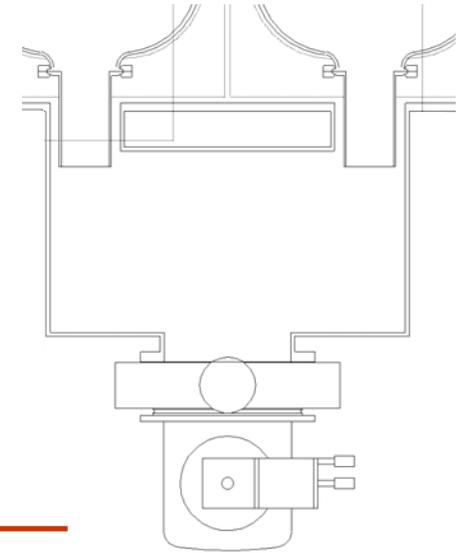
- Support structure concept uses large stiff plates welded directly to the vacuum vessel
- Structure will be designed to be strong and stiff enough to transmit coil forces to the ground
- Current support design height would allow the use of lateral rails for module installation/removal



Other RF/CC Components



- RF/CC vacuum system to use two cryo pumps per module
- Single pumps are connected to a manifold to pump two cavities plus the vacuum vessel
- Cavity extension tube limits conduction between vessel and cavity vacuum while protecting Be windows

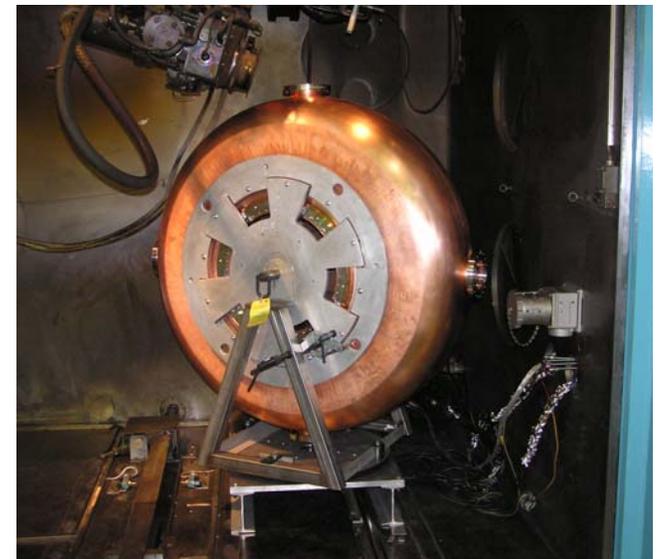


- Coupling loop design uses standard off-the-shelf copper co-ax
- Parts to be joined by torch brazing; integrated cooling in loop
- Design incorporates SNS style RF windows manufactured by Toshiba
- Bellows connection accommodates hard RF connection to cavity
- Loops for prototype nearly done; need to integrate design with MICE

Prototype Cavity Fabrication



- Fabrication of prototype RF cavity is nearing completion
- All e-beam welds have been performed and ports with flanges have been added
- Remaining tasks are: cavity interior buffing, chemical cleaning and high pressure water rinse, electropolishing, low power RF testing, high power RF conditioning



AFC Module Progress



- Design has been adapted for different cooling arrangements
- Cryo-cooler option has been incorporated in design
- Magnet design specification is finalized
- Control and instrumentation list completed
- Radiation shield conceptual design developed

